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Application No. 10/775,542
Filed: February 10, 2004
TC Art Unit: 3742
Confirmation No.: 6694REMARKS

Claims 1-12, 14-18, and 38 have been rejected under 35 U.S.C. § 103(a) over Rokhvarger (US 5,911,941) or Brennan (US 6,344,634) in view of Bowden (GB 2 262 333) combined with Sato et al. (US 2003/0071037) or Tsukamoto et al. (US 5,954,986). Reconsideration of this rejection is respectfully requested for the following reasons.

Independent claim 1 recites, among other things, a plurality of eductors each having an outlet located in a furnace chamber to provide circulation of gas within the furnace chamber. The Examiner indicates that there is no limitation in the claims specifying the function of the eductor as "a device that provides a high volume flow of gas." (Office Action, page 6) The Examiner also interprets the term "eductor" to encompass simple tubes or pipes. Specifically, Bowden has been cited for showing a furnace for sintering ceramics including "eductors" 23 on opposite sides of a furnace chamber 11. Sato has been cited for showing an "eductor" 9 for supplying a gas through holes 6a, 7a, 6b, 7b. The Examiner asserts that the elements 23 of Bowden and elements 9 of Sato are capable of providing circulation of gas within the furnace as actually claimed. (Office Action, page 6)

Applicants respectfully disagree with this interpretation of the term "eductor." Claims are to be given their broadest reasonable interpretation. The words of a claim are to be given their plain meaning, which is the ordinary and customary meaning of the words to one of ordinary skill in the art at the time of the invention. MPEP § 2111.01

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As would be known by one of ordinary skill in the art, an eductor is a device producing a high volume flow of a mixture of a gas entrained in an injected high pressure gas. (See U.S. Pat. No. 5,795,146, incorporated by reference in the specification.) The elements 23 of Bowden are not eductors. These elements are merely tubes that provide a flow path to and from the refractory box 11 to direct gas to a heater 20. (Bowden, page 7, lines 16-17.) Similarly, the element 9 of Sato is merely a degreasing gas lead pipe. (Sato, ¶ 0020, lines 1-3.) No entrainment of one gas into another occurs in the tubes of Bowden or pipe of Sato.

Thus, one of ordinary skill in the art would not interpret the term "eductor" in the present specification as a tube such as the tubes 23 of Bowden or pipe 9 of Sato. Nevertheless, to advance the prosecution, claim 1 has been amended to specify more particularly that the eductor comprises a device producing a high volume flow of a mixture of a gas entrained in an injected high pressure gas. Support for this amendment can be found in the specification at page 6, lines 17-20, which refers to U.S. Pat. No. 5,795,146, incorporated by reference in the specification. The relevant portion of this patent has been added to the present specification by amendment to provide explicit support for claim 1 as amended. See, for example, col. 1, lines 37-40, of U.S. Pat. No. 5,795,146. Accordingly, no new matter has been added by this amendment. Thus, claim 1 is believed to be patentable over Rokhvarger or Brennan in view of Bowden combined with Sato or Tsukamoto.

Additionally, Bowden has been cited for showing a "screen 24 supporting the workpiece 19 [that] may be porous to allow heated gas passing therethrough". The screen 24 is a thermal screen that

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surrounds an article to be sintered and is of a reticulated structure made of ceramic material. (Bowden, page 7, lines 28-33.) The Examiner states: "Clearly, since the workpiece is placed inside the screen 24, the screen is considered as the claimed support assembly." (Office Action, pp. 6-7) There is, however, no disclosure that such a reticulated thermal screen supports or is able to support a workpiece to be thermally processed. The intended function of the screen is to prevent or reduce loss of heat energy. (Bowden, page 7) Any supporting function would be incidental, and there is no suggestion that such an incidental supporting function exists. Rather, the thermal screen 24 is only illustrated schematically and is shown spaced from, not in supporting contact with, the article 19. Thus, the conclusion that the thermal screen 24 of Bowden supports a workpiece is not supportable.

Sato has also been cited for showing insulating walls 6 and 7 supporting a workpiece. However, the Examiner also states: "It is not necessary for Sato to indicate its insulating members are able to support the object to be sintered as long as it teaches the use of openings therein for air passages." (Office Action, p. 7) It is, however, error to ignore claim recitations. The claim explicitly recites "a support assembly disposable in the furnace chamber for supporting the materials to be thermally processed" and "one or more openings through the support assembly." There is no disclosure that such insulating members 6 and 7 support or are able to support the object to be sintered. The insulating members 6 and 7 are only illustrated schematically and are shown spaced from, not in supporting contact with, the object S. Again, the

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conclusion that the insulating members 6 and 7 support a workpiece is not supportable.

Nevertheless, to advance the prosecution, claim 1 as amended recites that the openings extend through the support assembly from one side of the furnace chamber to the other side. Neither the thermal screen of Bowden nor the insulating members of Sato show openings extending therethrough from one side to the other side of a chamber. Accordingly, claim 1 is believed to be patentable for this reason as well.

Tsukamoto has been cited to show air jet valves 19 above and below a load support 13 which includes openings 94 to allow air circulation therethrough. Tsukamoto relates to a type of microwave oven for cooking food including a turntable 13. The openings 94 in the turntable 13 do not extend through the turntable 13 from one side of the chamber to the other side. Also, the air jet valves are not eductors. Accordingly, Tsukamoto does not overcome the deficiencies of Rokhvarger, Brennan, Bowden, or Sato.

For these reasons, independent claim 1 and the claims dependent therefrom are believed to be patentable over Rokhvarger or Brennan in view of Bowden combined with Sato or Tsukamoto.

Claim 13 has been rejected under § 103(a) over Rokhvarger or Brennan in view of Bowden combined with Sato et al. or Tsukamoto et al. and further in view of Marks et al. (US 5,660,543). Claim 13 is believed to be patentable for the reasons set forth above with respect to claim 1 and no further comment thereon is believed necessary at this time.

Claims 19-37, 39, and 40 have been rejected under § 103(a) over Rokhvarger or Brennan in view of Bowden combined with Marks et al. (US 5,660,543).

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Independent claims 19 and 23 recite one or more eductors on each side of the furnace chamber. None of Rokhvarger, Brennan, or Bowden discloses, teaches, or suggests eductors. As noted above, the elements 11 of Bowden are not eductors, but rather are "tubes 23 to and from the refractory box 11." (Bowden, page 7, lines 16-17.) These tubes merely provide a flow path to direct gas to a heater 20. Eductors, in contrast, are devices that provide a high volume flow of a mixture of a gas entrained in an injected high pressure gas. Marks does not disclose eductors and thus does not overcome the deficiencies of Rokhvarger, Brennan, or Bowden in this regard.

Furthermore, claim 19 recites one or more eductors operative in alternating manner. Claim 23 recites a controller in communication with the eductors to operate the eductors in alternating manner. In Marks, an impeller 40 circulates air through a furnace. A diverter valve 58 is moved from one position to another to cause the flow to alternate. Marks, however, does not teach operating devices that provide high volume fluid flow in an alternating manner to provide such alternation of flow. Thus, claims 19 and 23 and the claims dependent therefrom are believed to be patentable for this reason as well.

The Examiner indicates that "the claimed 'alternating manner' is meaningless because only 'one or more eductors' or 'at least one eductor' is claimed." It is not seen how 'one or two eductors' can form an alternating pattern." (Office Action, page 7) This assertion is based on a misreading of the claims. Claim 19 recites "one or more eductors on each side of the furnace chamber." Similarly, claim 23 recites "at least one eductor on each side of the furnace chamber." The Examiner has ignored the recitation that

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there is an eductor on each side of the furnace chamber.

Accordingly, reconsideration of this basis for the rejection is requested.

Dependent claim 33 recites a plurality of openings extending through the hearth from one side of the furnace chamber to the other side, the eductors arranged in pairs on respective sides of the chamber in line with a respective opening through the hearth. None of the cited references discloses openings extending through a hearth from one side of a furnace chamber to the other, and concomitantly do not disclose eductors arranged in pairs in line with such openings. Accordingly, claim 33 is believed to be patentable for this reason as well.

In view of the above remarks, all claims are believed to be in condition for allowance, and reconsideration and withdrawal of the rejection are respectfully requested. The Examiner is encouraged to telephone the undersigned attorney to discuss any matter that would expedite allowance of the present application.

Respectfully submitted,
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